REMARKS

Claims 1-15 have been examined. New claims 16-23 have been added to further describe the patentable features of the present invention.

I. Rejection of claims 1-5, 9, 14 and 15 under 35 U.S.C. § 103

Claims 1-5, 9, 14 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kano (US Pub. No. 2002/0172150) in view of Ravikanth et al. (US 6,331,978). Applicants traverse the rejection as follows.

A. Claim 1

The present invention relates to establishing a restoration path in a transport network (e.g., SDH, SONET or OTN) by redirecting traffic of a failed physical link or logical path over a spare resource (see pg. 1-2 of Applicants' specification). More particularly, an exemplary embodiment of the present invention relates to circuit switched TDM technology such as SDH/SONET and adds label switching to this transport technology. For example, SDH/SONET has a fixed multiplex structure of virtual containers (also known as virtual tributaries in the SONET terminology) in each frame that does not change from one frame to another. These virtual containers are (TDM-) multiplex units that are used to define and establish end-to-end paths in the transport network. These multiplex units can carry any type of traffic (such as multiprotocol label switching (MPLS)). Thus, a label (or path tag) is assigned to these multiplex units (not to the MPLS packets inside the payload) and creates a new crossconnection when a new label is detected. This uniquely introduces a flexibility into circuit switched transport networks.

Kano, on the other hand, merely relates to a packet network where MPLS applies. MPLS is a packet switching technology and has nothing to do with the underlying transport technology,

which may be SONET. Thus, a label switching router in Kano has to look to the packets inside the payload that carries the labels. For example, when MPLS is carried over SONET, the MPLS labels (i.e., packet labels) are inside the payload section and are not visible to the transport layer. Hence, server layer connection transporting the MPLS traffic are necessarily static and do not change with the labels. Applicants note that it would not be possible to change server layer connections in dependence of labels of MPLS traffic carried inside the payload.

Claim 1 recites:

> A method of establishing a path through a transport network, said network comprising a number of physically interconnected network elements (NEn-1, NEn, NEn-1); transmission signals being transported over physical connections between said network elements; each transmission signal being subdivided into frames of the same length, said frames being structured according to a multiplex hierarchy into **multiplex units** respectively representing paths through said network and repeating every frame thereby forming **traffic streams** multiplexed to form said transmission signals; said method comprising the steps of
> - assigning each **traffic stream** an identifier called hereinafter a path tag which is sent in said traffic stream on a regular basis;
> - providing forwarding information (FT) in each network element along said path to be established;
> - receiving (a1) a new traffic stream at an input port (I1) of a network element (NEn);
> - checking (a2) the path tag of the received traffic stream and determining (a3) an appropriate output port (O2) based on said path tag and the forwarding information (FT); and
> - establishing (a4) an internal cross-connection between said input port (I1) and said previously determined output port (O2).[1]

The Examiner asserts on page 2 of the Office Action ("Response to Arguments") that Kano teaches providing a path tag, and more particularly, the path tag is attached to **packets** in MPLS (paragraphs 4, 6, 11 and 34-35) and the path tag is used to provide a proper output port based on forwarding information at each router.

[1] Emphasis added.

However, Kano appears at best to teach forwarding labeled packets from one transmission unit to the next transmission unit (paragraphs 34-35). Figure 1, however, does not relate to a transport network (i.e., SDH, SONET, or OTN). Thus, Kano does not teach assigning each traffic stream an identifier called hereinafter a path tag which is sent in said traffic stream on a regular basis. Claim 1 clearly defines a traffic stream as being formed by multiplex units which represent paths through the network and which repeat every frame. That is, assigning a label to a packet, as taught in Kano, is not equivalent to assigning a path tag to the traffic stream. Kano simply does not teach this feature.

Kano also fails to teach or suggest checking the path tag of the traffic stream and determining an appropriate output port therefrom. Kano merely teaches creating a fixed (semi-permanent) assignment of a particular time-slot of a particular input port to a particular timeslot of a particular output port (paragraph 4 and 143). However, it is important to note that the input and output interface identifiers are not transmitted in the data stream (traffic stream), and thus, the route a time slot has to go must be previously defined or pre-configured in the network element via network management (paragraphs 4 and 15). In other words, a label is attached (assigned) to the packets at the ingress node to specify a path to a particular destination (paragraph 4). Such assignment, however, is valid for all subsequent frames/time slots until it is changed. On the other hand, the present invention proposes to change the labels in the data stream to affect a re-routing of the data stream in the case of a failure. Thus, by checking the path tag of the received traffic stream and determining an appropriate output port based on said path tag and the forwarding information, the present invention uses the path tag to trigger the table lookup and re-routing. That is, a route a time slot has to go is not previously defined or

pre-configured in the network element, but instead can be dynamically changed during transmission of the traffic stream.

In view of the above, Kano fails to teach or suggest "assigning each **traffic stream** an identifier called hereinafter a path tag which is sent in said traffic stream on a regular basis" and "checking (a2) the path tag of the received traffic stream and determining (a3) an appropriate output port (O2) based on said path tag and the forwarding information (FT)" as recited in claim 1.

Furthermore, the Examiner merely cites to Ravikanth for teaching that transmission signals are transported over physical connections and each transmission signal is divided into frames for a multiplex hierarchy. However, even if Ravikanth teaches these features, Ravikanth fails to correct the aforementioned deficiencies of Kano. Therefore, Kano, alone or in combination with Ravikanth, fails to teach or suggest each and every feature of claim 1.

B. Claim 2

Applicants submit that claim 2 is patentable at least by virtue of its dependency upon claim 1. In addition, claim 2 recites "checking the path tag of the received traffic stream and determining an appropriate output port based on said path tag and the forwarding information of said second network element," which Kano fails to teach for reasons similar to those presented above in conjunction with claim 1.

C. Claims 3 and 4

Applicants submit that claims 3 and 4 are patentable at least by virtue of their dependencies.

D. Claim 5

Applicants submit that claim 5 is patentable at least by virtue of its dependency upon claim 1. In addition, claim 5 recites "said path tag is a label which is inserted by the preceding network element and which label will be replaced by the actual network element with a new label for the subsequent network element." Kano, however, does not disclose assigning each traffic stream in the transport network an identifier (i.e., a label) which is sent in said traffic stream on a regular basis. For example, Kano teaches that a label is attached (assigned) to the packets at the ingress node to specify a path to a particular destination (paragraph 4). Such assignment, however, is valid for all subsequent frames/time slots until it is changed. That is, neither the path, nor the label, changes once assigned at the ingress node. In addition, it appears a path is preprogrammed[2] and that the transmission units merely check the packet label in order to forward a packet to the next predetermined transmission unit (see paragraph 34).

Thus, claim 5 is patentable at least for these additional reasons in view of those presented above in conjunction with claim 1.

E. Claim 9

Claim 9 includes analogous, though not necessarily coextensive features to claim 1, and therefore, claim 9 is also patentable for the reasons discussed for claim 1. In addition, claim 9 recites allowing "said network elements to determine an appropriate output port for a traffic stream with an unexpected path tag received at an input port by using said path tag and said forwarding information and to establish an internal cross-connection between said input port and

[2] See page 3, numeral 3, of the present Office Action.

said previously determined output port." Applicants submit that Kano does not disclose these features for reasons presented above in conjunction with claims 1 and 5.

F. Claim 14

Claim 14 recites "the path tag of a corresponding traffic stream is part of a plurality of multiplex units that represent the corresponding traffic stream." Furthermore, claim 1 recites " said frames being structured according to a multiplex hierarchy into multiplex units respectively representing paths through said network and repeating every frame thereby forming traffic streams multiplexed to form said transmission signals". Kano merely teaches attaching a label to a packet (paragraph 4). Kano, however, does not teach or suggest a path tag being a part of a plurality of multiplex units, as defined in claim 14 in view of claim 1. That is, a packet does not represent a path through the network or represent the corresponding traffic stream, nor is it structured according to a multiplex hierarchy. Therefore, Kano, alone or in combination with Ravikanth, fails to teach or suggest this feature of claim 14.

G. Claim 15.

Claim 15 recites "the establishing the internal cross-connection is a self-routing mechanism." The Examiner acknowledges that Kano merely teaches that a path is preprogrammed. Thus, the establishing the internal crossconnection (between the input port and output port of a network element) is not a self-routing mechanism. That is, a transmission unit of Kano does not perform a self-routing mechanism, but merely forwards a packet to the next transmission unit according to a preprogrammed path (paragraphs 4 and 34). Therefore, Kano, alone or in combination with Ravikanth, fails to teach or suggest this feature of claim 15.

II. Rejection of claims 10 and 13 under 35 U.S.C. § 103

Claims 10 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kano in view of Ravikanth, in further view of Agrawal et al. (US Pub. No. 2004/0105383). However, Agrawal does not correct the deficiencies of Kano and Ravikanth with respect to claim 9. Therefore, claims 10 and 13 should be patentable at least by virtue of their dependency upon claims 9 and 10, respectively.

III. Rejection of claims 6-8 under 35 U.S.C. § 103

Claims 6-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kano in view of Ravikanth, and in further view of Ohba et al. (US Pub. No. 2002/0176370). Claim 6 and includes analogous, though not necessarily coextensive features, to claim 1, and therefore, claim 6 is also patentable for the reasons discussed for claim 1. Furthermore, Ohba fails to correct the aforementioned deficiencies of Kano and Ravikanth.

Claims 7 and 8 are patentable at least by virtue of their dependencies.

IV. Rejection of claims 11 and 12 under 35 U.S.C. § 103

Claims 11 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kano in view of Ravikanth and Agrawal, and in further view of Ohba et al. (US Pub. No. 2002/0176370). However, Ohba does not correct the deficiencies of Kano, Ravikanth and Agrawal with respect to claim 1. Therefore, claims 11 and 12 should be patentable at least by virtue of their dependency upon claims 1 and 11, respectively.

V. New claims

By this Amendment, Applicants have added new claims 16-23 to further define the claimed invention. Applicants respectfully submit claims 16-23 recite additional features which

are not taught or suggested by the prior art of record. Further, claims 16-23 should be deemed allowable by virtue of their dependency to claim 1 for at least the reasons set forth above.

VI. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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23373
CUSTOMER NUMBER

Date: July 16, 2008